

# SMath Studio Document

How Hard Would It Be To Build A  $\LaTeX$  File From SMath "Save As TeX"

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## INPUT

$$R_1 := 6500 \text{ mm}$$

$$\alpha_1 := 45.0^\circ$$

$$\alpha_2 := 50.0^\circ$$

$$L_1 := \frac{2 \cdot \pi \cdot R_1 \cdot \frac{\alpha_1}{360^\circ}}{\cos(\alpha_2)} = 7942.11 \text{ mm "or"}$$

$$L_1 := 7942.11 \text{ mm}$$

## METHOD 1

$$L_2 := \sqrt{L_1^2 - (R_1 \cdot \alpha_1)^2} = 6084.0108 \text{ mm}$$

$$L_3 := \frac{R_1}{\cos\left(\frac{\alpha_1}{4}\right)} \cdot \sin\left(\frac{\alpha_1}{2}\right) = 2536.1742 \text{ mm}$$

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$$L_4 := \frac{L_3}{\sin\left(\frac{\alpha_1}{4}\right)} \cdot \sin\left(180^\circ - \frac{\alpha_1}{2}\right) = 4974.8846 \text{ mm}$$

$$L_5 := \sqrt{L_2^2 + L_4^2} = 7859.0498 \text{ mm}$$

$$L_6 := \sqrt{L_3^2 - \left(\frac{L_4}{2}\right)^2} = 494.783 \text{ mm}$$

$$\alpha_3 := 4 \cdot \arctan\left(\frac{2 \cdot L_6}{L_5}\right) = 28.7063^\circ$$

$$R_2 := \frac{L_1}{\alpha_3} = 15851.8769 \text{ mm}$$

## METHOD 2

$$L_7 := \sqrt{\left(\frac{L_5}{2}\right)^2 + L_6^2} = 3960.5525 \text{ mm}$$

$$L_8 := \frac{R_1}{\sin\left(\frac{\alpha_1}{2}\right)} \cdot \sin\left(\frac{\alpha_1}{2}\right) = 2692.3882 \text{ mm}$$

$$L_9 := \frac{L_8}{\sin(90^\circ - \alpha_2)} \cdot \sin(\alpha_2) = 3208.6633 \text{ mm}$$

$$L_{11} := \sqrt{R_1^2 + L_8^2} - R_1 + L_6 = 1030.3323 \text{ mm}$$

$$L_{10} := \sqrt{L_8^2 + L_9^2} = 4188.6124 \text{ mm}$$

$$L_{12} := 2 \cdot \sqrt{L_{10}^2 - L_{11}^2} = 8119.8249 \text{ mm}$$

$$\alpha_3 := 4 \cdot \arctan\left(\frac{2 \cdot L_6}{L_{12}}\right) = 27.7936^\circ$$

$$R_2 := \frac{L_{12}}{2 \cdot \sin\left(\frac{\alpha_3}{2}\right)} = 16904.0752 \text{ mm}$$

$$L_d := 2 \cdot \pi \cdot R_2 \cdot \frac{\alpha_3}{360^\circ} = 8199.9868 \text{ mm}$$

$$L_k := 2 \cdot L_g = 6417.3265 \text{ mm}$$

$$L_t := L_{10} = 4188.6124 \text{ mm}$$